

REMARKS

Applicants thank the Examiner for the thorough examination of the application. No new matter is believed to be added to the application by this Amendment.

Status Of The Claims

Claims 1-13 are pending in the application. Claim 13 and the Amendments to claims 1 and 10 find support in the paragraph bridging pages 6 and 7 of the specification.

Rejection Under 35 U.S.C. §103(a)

Claims 1-12 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Tahara (US 2002/0026003) in view of Corvasce (U.S. Patent 5,672,639). Applicants traverse.

The present invention pertains to a rubber composition that, based on 100 parts by weight of diene rubber (A), includes 2 to 20 parts by weight of short fiber (B) having an average fiber diameter of 10 to 100 μm and average fiber length of 0.01 to 4 mm, 1 to 10 parts by weight of particles (C) having a Moh's hardness of at least 5 and average particle size of 30 to 500 μm , and 1 to 15 parts by weight of a starch/plasticizer composite material (D) (claim 1).

Of the many novel aspects of the present invention, one notable element is the average particle size of 30 to 500 μm . In the present invention, the digging friction can be improved only when the average particle size is at least 30 μm . The observations pertaining to the particles (C) are discussed in the specification at page 6, line 23 to page 7, line 10:

The average particle size of particle (C) is at most 500 μm . When the average particle size is more than 500 μm , reinforcing property for the rubber is poor and abrasion resistance is adversely affected. The lower limit of the average particle size of the particle is 10 μm , more preferably 30 μm and the upper limit is 300 μm , more preferably 150 μm . When the average particle size is less than 10 μm , the surface of the short fiber is difficult to be scratched and therefore the effect on digging friction tends to be inferior.

The amount of particle (C) is 1 to 10 parts by weight, preferably 1 to 8 parts by weight based on 100 parts by weight of the diene rubber (A). When the amount of particle (C) is less than 1 part by weight, the surface of the short fiber is difficult to be scratched and the effect on digging friction tends to be inferior. When the amount of particle (C) is more than 10 parts by weight, abrasion resistance tends to decrease.

Claim 1 of Tahara sets forth a rubber composition having diene rubber, glass fibers, a reinforcing agent and 1-15 parts by wt. of inorganic powder softer than the glass fibers and having an average particle size of "less than 25 μm ." Tahara is thus fundamentally different from the present invention, in which claim 1 recites a particle size of "30 to 500 μm ." From this difference in particle size, the surface of the short fiber in Tahara is difficult to scratch, and an improved effect of digging friction cannot be obtained because the average particle size of Tahara is too small.

At page 3 of the Office Action mailed September 6, 2005, the Examiner admits that Tahara fails to disclose a starch/plasticizer component. The Examiner turns to Corvasce for these teachings. However, Corvasce is utterly silent about combining short fibers and particles, and the effect to be obtained therefrom. That is, in Corvasce there is no description of the average particle size of the particles. Corvasce thus fails to address the deficiencies of Tahara in suggesting a claimed embodiment of the present invention.

Also, in the Examples of Corvasce, the particles are not blended. Therefore, one skilled in the art would have no teaching or suggestion that would provide motivation to assume that the average particle size of the particles has an influence on digging friction. Corvasce thus fails to disclose or suggest blending both short fibers and the particles having a particle size of “30 to 500 μm ” to improve the digging friction by scratching the short fiber.

From Tahara and Corvasce, one of ordinary skill in the art would only consider using particles having a size of “less than 25 μm ” (claim 1 of Tahara). In this case, an effect of improving the digging friction by scratching the short fiber cannot be expected. The rubber compositions of Tahara and Corvasce thus have poor performance on ice and snow.

As a result, one having ordinary skill in the art would not be motivated by Tahara and Corvasce to produce claim 1 of the present invention. A *prima facie* case of obviousness has thus not been made. Claims depending upon claim 1 are patentable for at least the above reasons.

Further, even if one assumes *arguendo* that the combination of Tahara and Corvasce is sufficient to allege obviousness, this obviousness would be fully rebutted by the unexpected results of the invention. These unexpected results are brought about by the interaction of the short fibers with particles having an average particle size of 30 to 500 μm , as was discussed above. Evidence of these unexpected results can be found in the values for wet gripping property, performance on ice and snow and abrasion resistance set forth in Table 1 at page 15 of

the specification (where the Examples of the present invention contain emery having an average particle size of 100 μm). The advantages of the present invention are thus clear.

This rejection is overcome and withdrawal thereof is respectfully requested.

Information Disclosure Statements

The Examiner is thanked for considering the Information Disclosure Statements filed July 24, 2003 and April 6, 2004 and for making the initialed PTO-1449 forms of record in the application in the Office Actions mailed September 6, 2005 and February 17, 2006.

Conclusion

The Examiner's rejection has been overcome. It is believed that a full and complete reply has been made to the Office Action. No issues remain. The Examiner is accordingly respectfully requested to place the application in condition for allowance and to issue a Notice of Allowability.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Robert E. Goozner, Ph.D. (Reg. No. 42,593) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Dated: August 16, 2006

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Respectfully submitted,

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